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2020-12-22

Brouwer , D J 2020 , ' A non-discrimination principle for rankings in app stores ' , Internet policy review , vol. 9 , no. 4 . https://doi.org/10.14763/2020.4.1539

http://hdl.handle.net/10138/324840
https://doi.org/10.14763/2020.4.1539

INTERNET POLICY REVIEW
Journal on internet regulation

Volume 9 | **Issue** 4

RESEARCH ARTICLE

OPEN ACCESS

PEER REVIEWED

A non-discrimination principle for rankings in app stores

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DOI: https://doi.org/10.14763/2020.4.1539

Published: 22 December 2020
Received: 16 June 2020 **Accepted:** 31 August 2020

Funding: The research was made possible by a one-year research grant from Suomalainen Lakimiesyhdistys (SLY).
Competing Interests: The author has declared that no competing interests exist that have influenced the text.

Citation: Brouwer, D. (2020). A non-discrimination principle for rankings in app stores. *Internet Policy Review*, *9*(4). https://doi.org/10.14763/2020.4.1539

Keywords: App Store, Regulation, Rankings, Non-discrimination, Net neutrality

Abstract: The gatekeeper position of app store operators gives them the power to favour their own and the most popular applications in the rankings of search results. Based on parallels with the non-discrimination principle in the European Union's Regulation on Open Internet Access, this article formulates a list of permitted and forbidden ranking rationales for app store operators. Permitted ranking rationales include text relevance, price, quality and the legality of content. These rationales contrast with the forbidden ranking rationales, such as those based on self-favouring without objective justification and the popularity of applications, which potentially limit consumer choice and distort the digital level playing field.

Introduction

When consumers search for applications on their smartphones, they often start their discovery with entering queries into the search function of app stores. Based on those queries, the algorithms of app store operators generate sarch results, giving certain applications a more visible position than other applications. Consumers are more likely to select applications that have a top position in the rankings. Dogruel et al. (2015) show that the first five search results in app stores receive an estimated 87% of the traffic through search. This means that discriminatory rankings of search results can limit consumer choice and the ability of app developers to compete within app stores.

App stores serve as a gateway for connecting app developers and consumers. They turn from gateways into gatekeepers when they limit the ability of app developers to reach consumers (Bostoen, 2018, p. 11). The vertical integration of app stores gives them the economic incentive to give their own applications a competitive advantage in the rankings of search results (Krämer & Schnurr, 2018, p. 523). Nicas and Collins (2019) report that Apple has favoured its own applications over those of competitors in the rankings in the App Store. Others argue that rankings based on popularity favour large and established players, placing small and new businesses on a lower competitive footing (Pandey et al., 2005, p. 1).

Due to high legal standards, EU competition law currently does not allow the European Commission to intervene effectively against discriminatory rankings in app stores. To complement EU competition law, the EU legislator adopted the Platform-to-Business Regulation (Regulation (EU) 2019/1150, P2B Regulation) in June 2019. The P2B Regulation contains various transparency obligations for the rankings of search results in app stores. However, the P2B Regulation does not contain a prohibition of discrimination between app developers in those rankings.

Referring to the gatekeeper position of platforms, some scholars argue in favour of a non-discrimination principle for the rankings of search results (Pasquale, 2008, pp. 266-267). Bostoen (2018) draws parallels with EU telecom regulation, including net neutrality. On 30 April 2016, the Open Internet Access Regulation (Regulation (EU) 2015/2120, OI Regulation) entered into force. The Regulation introduces an obligation for providers of internet access services (ISPs) to treat traffic within their networks without discrimination. The EU legislator justifies this *ex ante* non-discrimination principle based on the gatekeeper position of ISPs. The OI Regulation seeks to prevent discriminatory practices of ISPs that reduce the incentives for online businesses to compete and innovate within the internet ecosystem.

Based on parallels with the non-discrimination principle in the OI Regulation, this article proposes a new *ex ante* EU-wide regulatory regime that prohibits app store operators to treat applications differently in the rankings of search results without objective justification. The article arrives at a (non-exhaustive) list of forbidden and permitted ranking rationales and variables for app stores. Ranking rationales refer to the economic or legal logic of app store operators for engaging in specific ranking practices. Permitted ranking rationales are formulated, such as those based on quality and price, which reflect consumer choice and the parameters of effective competition between app developers in a market economy. Ranking rationales, which potentially limit consumer choice and distort the digital level playing field, include self-favouring without objective justification and the popularity of applications. The proposed framework could serve as a source of inspiration for a prohibition of discriminatory rankings under the new Digital Markets Act.

This article is structured as follows. Firstly, the article describes how Apple ranks search results within the App Store (section 1). Apple's ranking practices are used as a case study in this article. Secondly, the article explores the need for new *ex ante* sector-specific regulation of discriminatory rankings in app stores, complementing EU competition law (section 2). Based on theoretical and empirical literature, this article identifies several shortcomings of the enforcement of EU competition law against discriminatory rankings in app stores. The article also shows that the P2B Regulation does not contain a prohibition of such discriminatory practices. Supported by doctrinal legal research, this article derives a new framework from the OI Regulation for the regulation of rankings in app stores (section 3). The proposed non-discrimination principle is then applied to the case of Apple's rankings within the App Store (section 4). Finally, some of the counter-arguments, as identified in the literature on the regulation of online search, are rebutted (section 5).

Section 1: Apple's ranking practices in the App Store

Introduction

In 2008, Apple launched the App Store and enabled app developers to produce apps for its operating system, iOS (ACM, 2019, p. 20). App store operators are active in two-sided markets, which are subject to indirect network effects (Evans, 2003, p. 192). Indirect network effects mean that Apple's platform is more attractive to consumers when there is a range and diversity of popular applications available in its App Store. In order to convince app developers to launch their applications in the App Store, Apple must attract a sufficiently large consumer base. An important way for app store operators to attract consumers is to make it easier

for consumers to find their preferred applications through the search function in the app store. Data from *Sensor Tower* shows that the majority of app downloads in the App Store originates from search (Briskman, 2018).

The ranking of apps within the App Store

When consumers want to find an application on their iPhone, they can enter queries into the search function of the App Store. Based on about 42 variables, Apple's algorithms rank the applications for a given search query and provide search results to the consumer (Nicas & Collins, 2019). Although Apple's algorithms are largely a "black box", Apple has published the following rationales and variables for the ranking of *organic* search results:

- The first ranking rationale is the *text relevance* for a given search query entered by the consumer. This ranking rationale includes ranking variables such as the name of the application, keyword field and the selected primary category of the application (Apple, 2020).
- The second ranking rationale concerns the *quality* of the applications. This rationale covers variables such as the average rating of consumers and the quality of reviews (Apple, 2020).
- The third ranking rationale is the *popularity* of applications. This ranking rationale covers variables such as the amount of downloads and the number of ratings and reviews (Apple, 2020). The use of these variables may favour large and established over small and new app developers in downstream markets. The reason is that popularity often correlates with market positions of firms (Pandey et al., 2005, p. 1).
- The fourth ranking rationale is the *personalisation* of search results in the App Store. This rationale consists of variables such as the search and purchase history of consumers (Apple, 2020).

Potentially discriminatory ranking practices

Reportedly, Apple has systematically favoured its own applications in the rankings of the App Store. Based on 600 searches on six iPhone models in the US, Mickle (2019) found that Apple's applications are ranked first in 95% of searches for applications that generate revenue through subscriptions or sales. Nicas and Collins (2019) report that Spotify used to be ranked first in the App Store for the search term "music" in the United States. However, the launch in June 2016 of Apple's own music-streaming service, Apple Music, caused a drop in the rankings for Spotify. Apple Music has appeared first in the rankings in the category "music" since its introduction (Nicas & Collins, 2019).

Apple has acknowledged that it does not apply consumer ratings and reviews to its

own pre-installed applications, while these variables do affect the rankings of competitors' applications (Mickle, 2019, p. 6). However, Apple has stated that it does not favour its own applications over others in the rankings of its search results. Apple claims that the high rankings of its own applications are based on "user behaviour data" and can be explained by the "strong connection" of consumers with Apple's services (Mickle, 2019, p. 1).

Apple's self-favouring ranking practices and the use of the popularity ranking rationale raise concerns. When online businesses expect that a platform will discriminate against them, they are less likely to compete and innovate (Khan, 2018, p. 1008). EU competition law currently does not deal effectively with discriminatory ranking practices in app stores (section 2). At the same time, the P2B Regulation does not contain *ex ante* rules that prohibit discriminatory rankings in app stores (section 2).

On 15 December 2020, the European Commission published a proposal for a new Digital Markets Act (DMA). The proposed DMA bans self-favouring ranking practices by app stores that will be designated as "gatekeepers" under the DMA (section 3). It remains to be seen whether the proposed prohibition will also be included in the final text of the DMA, which requires that the prohibition is accepted by the European Parliament and the Council in the legislative procedure.

Section 2: The need for new *ex ante* sector-specific regulation complementing EU competition law

Limitations of EU competition law

The European Commission and the Netherlands Authority for Consumers and Markets (ACM) have announced competition law investigations into several practices of Apple surrounding its App Store. Yet, these authorities do not seem to focus their investigations on discriminatory rankings in Apple's App Store.

Geradin and Katsifis (2020) argue that Apple's self-favouring ranking practices (section 1) could potentially be qualified as an abuse of dominance under EU competition law. Nevertheless, for several reasons, this article argues that EU competition law provides the European Commission with limited means to intervene effectively *ex post* against discriminatory rankings in app stores. Firstly, the substantive legal standards for intervening against self-favouring ranking practices are unclear. The *Google Search (Shopping)* decision from the European Commission shows that self-favouring ranking practices of dominant platforms can constitute an ex-

clusionary abuse under EU competition law (European Commission, 2017, para 341). However, the decision leaves legal uncertainty as to what substantive legal standards determine whether a specific differential ranking practice amounts to abusive self-favouring (Zingales, 2019, pp. 407-408).

Secondly, the substantive legal standards for intervention are presumably too high in cases where the use of the popularity ranking rationale systematically favours large over small app developers in app stores. One important reason is that EU competition law aims to protect effective competition, but does not seek to safeguard a level playing field for all firms (Graef, 2019, p. 480). For example, if a new app developer is not (yet) as efficient as the dominant app store operator in the downstream market, EU competition law generally provides little protection to this app developer.

Thirdly, the long average duration of EU competition law cases undermines the ability of the European Commission to prevent restrictions of competition in downstream markets by dominant platforms (Van Gorp & De Bijl, p. 201). Cases regarding abuse of dominant position have an estimated average duration of 61 months (Dethmers & Blondeel, 2017, p. 161). This is due to the laborious work of defining the relevant market, evaluating dominance and establishing a theory of harm, which is especially complicated in digital markets. Posner (2000) argues that lengthy procedures are particularly problematic in digital markets where conditions change rapidly.

Some scholars, such as Lundqvist (2019), have argued that the EU legislator should not turn to *ex ante* sector-specific regulation, but should wait for EU competition law to develop new tests and tools. There are various initiatives to improve the effectiveness of the enforcement of EU competition law against discriminatory practices of "digital gatekeepers" (Furman, 2019, p. 41). The European Commission currently explores the need for a new competition tool to ensure "timely and effective intervention against structural competition problems across markets", which includes competition problems related to digital gatekeepers (European Commission, 2020, p. 1). Scholars have also proposed several legal shortcuts to enable speedier interventions against platforms that act as digital gatekeepers. For example, Van Gorp and De Bijl (2019) propose a policy option where a discriminatory practice of a vertically integrated platform gives rise to a legal presumption of an abuse of dominance (Van Gorp & De Bijl, 2019, pp. 43-44).

Although these initiatives and proposals seem promising, some scholars have rightly pointed out that it is currently unclear when a platform should be consid-

ered a "digital gatekeeper" under EU competition law (Graef, 2018, p. 486). The European Commission and European courts have not yet defined and applied this concept in EU competition law cases (Alexiadis & De Streel, 2020, pp. 5-6). The shortcomings of EU competition law, as mentioned in this section, therefore *also* justify the exploration of complementary *ex ante* regulation by the EU legislator.

The proposal for the DMA acknowledges that EU competition law provides limited means to intervene timely and effectively against a number of harmful practices of digital gatekeepers (Proposal DMA, consideration 5). The DMA seeks to complement EU competition law and includes, *inter alia*, an *ex ante* prohibition of self-favouring rankings of app stores that are designated as "gatekeeper" under the DMA (section 3). In contrast to EU competition law, the proposal for the DMA sets out a framework for determining whether a specific platform must be considered a digital gatekeeper (Proposal DMA, Article 3).

The Platform-to-Business Regulation

To complement EU competition law, the EU legislator adopted the P2B Regulation in June 2019. The Regulation contains *ex ante* rules to improve fairness, transparency and effective redress possibilities in the commercial relationship between providers of online intermediary services (platforms) and businesses that provide their services through these platforms (online businesses). The Regulation mentions that platforms "serve as a gateway to consumers" and are "crucial for the commercial success of undertakings who use such services to reach consumers" (Regulation (EU) 2019/1150, considerations 2 and 12). The P2B Regulation seeks to promote fairness and transparency in this relationship of economic dependency between platforms and online businesses, with the aim of enhancing trust in the platform economy (Regulation (EU) 2019/1150, considerations 2 and 3).

To achieve its goals, the P2B Regulation introduces, *inter alia*, various transparency requirements for the rankings of platforms such as app stores. The transparency obligations in the P2B Regulation seek to balance between 1) the interest of online businesses to get an adequate understanding of the functioning of the algorithms, and 2) the interest of app stores to prevent imitation and "gaming" of the algorithms (Regulation (EU) 2019/1150, consideration 27).

The first transparency obligation means that app stores must be *transparent about the main ranking variables and changes in those variables*. Article 5(1) of the Regulation imposes the obligation on app stores to describe in their terms and conditions 1) the number and type of main variables used to rank services on their platform

and 2) the reasons of the relative importance of those variables as compared to other variables. Furthermore, app stores are required to notify online businesses about changes in the main ranking variables in their terms and conditions (Regulation (EU) 2019/1150, Article 3(2) in conjunction with Article 5(1)). Article 3(2) of the P2B Regulation states that the notification must generally be provided at least 15 days before applying the changes in the main variables. The main ranking variables are to be selected by the app stores themselves (European Commission, 2020, paras 39-42), which may cover those currently published by Apple (section 1).

The second transparency obligation entails that app stores should provide *transparency regarding decisions to lower the rankings of applications*. Article 4(1) of the P2B Regulation states that app stores must provide a "statement of reasons" when they decide to demote the rankings of a specific application (Regulation (EU) 2019/1150, consideration 22). The statement must enable the app developer to challenge the demotion in rankings within the internal complaint-handling process of the app store (Regulation (EU) 2019/1150, consideration 22). Furthermore, under Article 12 of the Regulation, a large app store and app developer also have the possibility to solve a dispute concerning the demotion in rankings through mediation. If the app developer successfully challenges the decision to lower its rankings, Article 4(3) of the Regulation obliges the app store to correct the demotion "without undue delay". However, the P2B Regulation does not contain any rules as to when a demotion in rankings would be unjustified.

Article 7(1) of the P2B Regulation contains the third transparency obligation, which entails that app stores should be *transparent about the differential treatment between own applications and those of competitors*. Article 7(3) mentions that such differential treatment includes the favouring of own applications in the rankings of search results. Article 7(1) states that the app store must be transparent about the "main economic, commercial or legal considerations for such preferential treatment".

The P2B Regulation does not contain an *ex ante* prohibition of discrimination in the rankings of search results in app stores. The European Commission has stated that a "fully binding solution (…) prohibiting the trading practices in question (…)" is not adopted because it was considered "disproportionate" (European Commission, 2018, p. 2). One reason for this could be that most obligations in the P2B Regulation apply to all online platforms, regardless of their size. This article proposes an *ex ante* prohibition of discriminatory rankings that would only apply to app stores that act as digital gatekeepers. The non-discrimination principle for

rankings in app stores, as proposed in this article, can be used as a source of inspiration for a prohibition of discriminatory rankings under the DMA.

Section 3: The parallels with the Open Internet Access Regulation

Justifications for deriving inspiration from the Open Internet Access Regulation

As stated above, the European Commission has published a proposal for a new Digital Markets Act (DMA) on 15 December 2020. The goal of the DMA is to ensure the contestability and fairness of digital markets (Proposal DMA, Article 1(1)). Article 6(1), under d, of the proposed DMA lays down a prohibition for digital platforms, designated as gatekeepers, to "refrain from treating more favourably in ranking services and products offered by the gatekeeper itself (…) compared to similar services or products of third party and apply fair and non-discriminatory conditions to such ranking". The aim behind this proposed prohibition is to prevent digital gatekeepers from undermining the contestability for services (e.g. music streaming services) offered through their platforms (Proposal DMA, consideration 48). The European Commission has mentioned in earlier documents that *ex ante* regulation in the telecom sector can be a useful source of inspiration for the new legal framework in the DMA (European Commission, 2020, p. 4). Based on parallels with EU telecom legislation, this article provides proposals for the way that the EU legislator can shape a prohibition of discriminatory rankings in the DMA. It also shows how the European Commission can apply this prohibition to app stores when implementing and enforcing the DMA in the future.

Drawing parallels with the OI Regulation, this article proposes new *ex ante* EU regulation that forbids app store operators to differentiate in the rankings of search results without objective justification. The motivation for drawing parallels with the OI Regulation is twofold. Firstly, both ISPs and app store operators are gatekeepers of the internet. This gives these companies the power to discriminate against competitors, which reduces the incentives of competitors to compete and innovate. Secondly, the OI Regulation contains a non-discrimination principle, which provides a useful source of inspiration for the regulation of rankings in app stores. Based on parallels with the OI Regulation, the EU legislator is able to provide flexibility to app store operators to engage in ranking practices that reduce search costs for consumers, while prohibiting those practices that limit consumer choice and distort the level playing field.

The article acknowledges that app store operators and ISPs differ in various ways from each other. These companies offer different types of services and operate in different markets. For example, a number of ISPs used to be public companies, which were privatised in the EU from the 1980s onwards (Savin, 2018, p. 13). App store operators do not share this history with ISPs. Possibly, app store markets are also more dynamic in terms of innovation than the markets in which ISPs operate. Despite these differences, drawing parallels with the OI Regulation enables the EU legislator to formulate clearly defined prohibitions of specific discriminatory ranking practices in app stores. The OI Regulation sets out two legal frameworks to assess if the use by ISPs of a specific rationale for differential treatment of traffic violates the non-discrimination principle. These legal frameworks can be used to formulate specific permitted and forbidden ranking rationales for app stores (section 4).

The gatekeeper position of ISPs and app store operators

Providers of internet access services

ISPs can be considered gateways for connecting online businesses and consumers. Two conditions can be formulated for the gateway position of ISPs. Firstly, the internet access services that ISPs provide are crucial for online businesses to reach consumers. Secondly, consumers have few alternatives to access the applications of online businesses next to their internet access service.

For a specific group of online businesses, such as music and video streaming services, internet connectivity is *indispensable* for reaching consumers with their applications. It is crucial for this group of firms that an ISP provides them with an internet access service that meets the quality of service requirements of their applications. If an ISP blocks or throttles the traffic of these applications, this affects the quality of experience of the consumer (European Commission, 2015, p. 2). It makes the service less attractive to consumers, potentially leading to a decrease in consumers and a loss of revenues for the online business.

Consumers also have few alternatives besides the internet access service of their current ISP to access the applications of their choice. Due to high economic and legal barriers to entry in telecom markets (Hauge & Jamison, 2009, pp. 23-25), a limited number of ISPs is active in the national telecom markets of EU member states (Lear et al., 2017, pp. 40 and 53). Another factor that makes consumers dependent on their ISP, are the relatively high costs of switching between ISPs (Hauge & Jamison, 2009, p. 25). Data for the Netherlands shows that only 11% of the Dutch consumers of mobile subscriptions switched between mobile providers in a period

of 12 months in 2019-2020 (ACM, 2020, p. 18).

ISPs are thus gateways for connecting a specific group of online businesses and consumers. The OI Regulation seeks to prevent ISPs from turning into *gatekeepers* that pick winners and losers on the internet (European Commission, 2015, p. 2). The vertical integration of ISPs gives the economic incentive to treat the traffic of their own applications more favourably than the traffic of competitors. With the adoption of the OI Regulation, the EU legislator responded to the frequently reported discriminatory practices of ISPs to block or throttle the traffic of Voice over IP services and peer-to-peer services (BEREC, 2012, p. 8).

App stores

App stores can also be regarded as a gateway for connecting online businesses and consumers. Firstly, app stores provide a service crucial for app developers to reach consumers. Secondly, consumers have few alternatives for accessing the applications of app developers next to app stores. This section will illustrate this based on the case study of Apple's App Store.

For app developers, Apple's App Store is crucial to reach iPhone users. Hyrynsalmi et al. (2016) show that multi-homing by app developers between app stores is relatively uncommon.For the App Store, 2.6 to 4.9% of the applications are offered in one or more other app stores (Hyrynsalmi et al., 2016, p. 122). Even if an app developer is multi-homing between different app stores, it is still crucial for an app developer to be present in the App Store. The decision to withdraw from the App Store would make it difficult for the app developer to serve iPhone users, which will likely result in a loss of consumers and revenues (Geradin & Katsifis, 2020, p. 32). Within Apple's ecosystem, app developers have few alternative channels to reach iPhone users (ACM, 2019, pp. 43-46). For example, another option for app developers could be to offer content via web-apps. However, apps provided through the App Store give better access to the hardware functionalities of an iPhone (e.g., the camera or GPS), while web-apps do not offer the possibility of “swiping” (ACM, 2019, p. 43).

Consumers that use the iPhone also have few alternatives besides Apple's App Store to access the applications of their choice. Most consumers use one smartphone (Höppner et al., 2013, p. 6). Due to the high barriers to enter these markets, consumers have few options when choosing their preferred operating system (European Commission, 2018). When consumers use an iPhone, Apple's App Store is the only app store available on iOS (ACM, 2019, p. 21). ACM (2019) shows that consumers have few alternatives to the App Store for accessing apps on their iPhone,

except some limited possibilities for "tech-savvy" consumers (e.g. "jailbreaking"). The costs for consumers to switch between operating systems is high because of, *inter alia*, the effort to learn how to use another operating system (European Commission, 2018, para 527). As a result, consumers may become "locked-in" with Apple's ecosystem beyond the life cycle of their iPhone (ACM, 2019, p. 55). For example, in the Netherlands, only 9% of the consumers who bought another smartphone in 2018 voluntarily switched between operating systems (ACM, 2019, p. 53).

App store operators turn from gateways into gatekeepers when their rankings of search results limit the ability of app developers to reach consumers. As indicated in the introduction, Dogruel et al. (2015) show that the first five search results in app stores receive an estimated 87% of the traffic through search. [1] At the same time, Apple increasingly plays the "dual role" of a platform operator and a market participant in downstream markets (Khan, 2019, pp. 983-984). This vertical integration gives Apple the economic incentive to favour its own downstream applications over those of competitors. Apple's self-favouring ranking practices (section 1) provides an example where an app store operator turns into a gatekeeper. Another example is when the use of the popularity ranking rationale results in a systematic advantage for large app developers (section 1).

The non-discrimination principle in the Open Internet Access Regulation

In *Telenor Hungary* (2020), Advocate General Sánchez-Bordona considered the protection of an open internet as the primary aim of the OI Regulation. The internet is considered open when it is an "open platform for innovation with *low access barriers* for end-users" (OI Regulation, consideration 3). To achieve this aim, the OI Regulation lays down a non-discrimination principle for the treatment of traffic by ISPs. This allows ISPs to differentiate between traffic within their networks, as long as the consumers´ freedom to access the applications of their choice (i.e., consumer choice) is not limited and the level playing field is not distorted. This contrasts with a strict neutrality principle, which would require the *equal* treatment of traffic by ISPs. The EU legislator seeks to give room to ISPs to handle traffic efficiently and provide innovative connectivity services, while safeguarding an open internet (ACM, 2018, p. 10).

1. The estimate of 87% is based on observations of 49 smartphone users from the United States and Germany viewing 189 apps in the Google Play Store from three predetermined categories of apps on a laboratory smartphone. In personal correspondence, the authors mentioned they "do not expect any different findings" were they to replicate the study (L. Dogruel et al., personal communication, 13 October 2020).

Similarly, the proposed non-discrimination principle for rankings of search results within app stores aims to find a balance between 1) giving app store operators the flexibility to engage in ranking practices that reduce search costs for consumers, and 2) prohibiting those practices that limit consumer choice and distort the level playing field (section 4).

The two legal frameworks in the Open Internet Access Regulation

The OI Regulation sets out two legal frameworks for assessing if ISP practices violate the non-discrimination principle. In *Telenor Hungary* (2020), Advocate General Sánchez-Bordona stated that both frameworks aim to protect the right of end users to open internet access, as laid down in Article 3(1) of the Regulation. This right consists of 1) the right for consumers and business users of internet access services to access the applications of their choice and 2) the right for content and application providers (online businesses) to provide their applications via the internet access service. The first element seeks to protect *consumer choice*, while the second element seeks to safeguard a *level playing field* on the internet. It aims to ensure that small and new players, such as digital start-ups, can compete on an equal footing with big and established players (European Commission, 2015, p. 2).

The first legal framework applies to agreements and commercial practices of ISPs. The second legal framework deals with technical measures of ISPs to differentiate between traffic within the network. Central to both frameworks are the potential and actual effects of a practice on the open internet. In *Telenor Hungary* (2020), the European Court of Justice ruled that the first framework requires authorities to assess the effects of the practice on the rights of end-users as laid down in Article 3(1), while the second framework does not.

Agreements and commercial practices

Article 3(2) of the OI Regulation sets out a legal framework for practices relating to the commercial relationship between ISPs and end users. This category includes 1) agreements between ISPs and end-users on commercial and technical conditions of internet access services, and 2) any commercial practices of ISPs. One specific example of a commercial practice is “zero-rating”. Zero-rating refers to a practice where the ISP does not count the use of certain applications towards the monthly maximum data that consumers can use for mobile internet (Krämer & Peitz, 2018, p. 502).

Article 3(2) states that these agreements and commercial practices are allowed, as long as these do not limit the exercise of the end users' right to open internet ac-

cess as laid down in Article 3(1). A zero-rating service violates the non-discrimination principle when it limits consumer choice and distorts the digital level playing field. Based on multiple factors, national regulatory authorities must assess this on a case-by-case basis (BEREC, 2020, paras 42-48). In particular, the authorities should evaluate whether the zero-rating is open to all applications within a certain category (e.g. music streaming). They must assess the barriers to enter the zero-rating scheme and the number of small businesses that have entered the zero-rating (Krämer & Peitz, 2018, p. 508). In other words, the zero-rating scheme may not be based on *the rationale of favouring the large and popular over small and new businesses*.

Technical treatment of traffic

Article 3(3) of the OI Regulation contains a legal framework for the technically differential treatment of traffic within the networks of ISPs. These practices vary from giving temporary priority to certain traffic (e.g. VoIP) over other traffic (e.g. e-mail) in a situation of network congestion, to the practice of throttling or blocking traffic of specific applications. The European Court of Justice ruled in *Telenor Hungary* (2020) that national regulatory authorities can assess these technical measures—in parallel—under Article 3(2) and 3(1), to the extent that these measures are included as technical conditions in the agreements with end users.

Article 3(3) contains the general rule that ISPs must treat all traffic equally and without discrimination in technical terms. Under Article 3(3), second paragraph, ISPs are allowed to take reasonable traffic management measures. This provision allows technical differentiation between traffic by ISPs to efficiently handle traffic and prevent congestion in the network. To be considered reasonable, traffic management measures must meet several cumulative requirements. One of these requirements is that the rationale for these measures should be based on objectively technical requirements of traffic, and may not be based on commercial considerations. This ban covers the prioritisation of traffic from the ISP's own applications without objective technical justification. In other words, the OI Regulation categorically bans prioritisation of traffic based on the *rationale of self-favouring without objective justification*.

Section 4: Application of the framework to Apple's ranking practices

The non-discrimination principle in the OI Regulation can be used as a source of inspiration for the regulation of discriminatory rankings in app stores. Based on

the case study of Apple's App Store, a list of permitted and forbidden ranking rationales is developed. The article formulates several permitted ranking rationales that do not limit consumer choice or distort the level playing field. The article proposes a categorical ban of self-favouring ranking rationales without objective justification and an effects-based prohibition of the popularity ranking rationale. A public authority in the EU could monitor and enforce the proposed regulatory framework. The article leaves open whether this should be a new or existing public authority.

Permitted ranking rationales

It is the very business of app store operators to rank applications when consumers search for their preferred application. However, Chandler (2007) rightly argues that online businesses should not be subject to discriminatory ranking rationales that the consumer would not use. When app store operators use ranking rationales based on text relevance, quality and personalisation (section 1), this merely *reflects consumer choice* and the parameters of effective competition in a market economy. The same reasoning applies to rationales related to the price and legality of content. The use of these ranking rationales reduces search costs for consumers, which is welfare-enhancing (Martens, 2016, p. 20). Under the proposed non-discrimination principle, these would constitute permitted ranking rationales.

Consumers may have different notions of the quality of applications and the desirability of personalisation of search results. The EU legislator could facilitate consumer choice by requiring app stores to implement a functionality enabling consumers to opt-in and opt-out of ranking variables relating to quality and personalisation.

Forbidden ranking rationales

This section discusses the proposed framework for self-favouring ranking rationales without objective justification, the popularity ranking rationale, and a circumvention by app store operators of the forbidden ranking rationales.

Unequal application of ranking variables

Apple has stated that it does not apply consumer ratings and reviews to its own pre-installed applications, while these variables do affect the rankings of competitors' applications (section 1). An Apple spokesperson argued that “pre-installed apps don't need to be rated because they're already integrated into the iPhone” (Mickle, 2019, p. 6). Based on this information, Apple's justification for the unequal

application of ranking variables does not follow from one of the formulated permitted ranking rationales such as quality or price.

If Apple cannot provide an objective justification for excluding its own applications from the application of certain ranking variables, then it should be regarded as the forbidden ranking rationale of *self-favouring without objective justification*. The higher position of Apple's own applications would then not be based on the merits of its applications, but would give Apple an artificial competitive advantage. The use of such a ranking rationale would violate the proposed non-discrimination principle, as it would unjustifiably steer consumers and distort the level playing field in favour of Apple's own applications.

Variables favouring own applications

Apple has reportedly engaged in ranking practices where it favoured its own applications (e.g. Apple Music) over those of competitors (e.g. Spotify). As Apple's algorithms are largely a "black box", there is not much public information available about their exact functioning (section 1). This article discusses various scenarios that have been reported in the context of other markets (i.e. airlines and e-commerce platforms). This section shows how the proposed non-discrimination principle would deal with each of the scenarios.

The first scenario is that Apple favours its own applications in the App Store's rankings based on permitted ranking rationales such as quality. In this scenario, Apple is able to provide an objective justification for its ranking practices. The ranking practice would be allowed under the proposed non-discrimination principle.

The second scenario is that its own applications are ranked more favourably than those of competitors based on variables relating to Apple's own identity. In the past, airlines in the United States applied variables relating to their own identity in their Customer Reservation System (CRS). When travel agents searched for flights through CRS, the airlines' own flights were often ranked first, even though other companies offered lower prices or better service (Edelman, 2011, p. 27). Eventually, the United States Department of Justice intervened and introduced rules prohibiting variables relating to the airlines' own identity (Edelman, 2011, p. 27).

A third scenario is that Apple uses ranking variables relating to the profitability for its own business. Mattioli (2019) reports that Amazon had plans to add "proxies for profit" to its search algorithms used on the market platform. These proxies are variables that correlate with the profitability of rankings for Amazon's own busi-

ness, which might not be observable for consumers and online businesses (Mattioli, 2019, p. 6).

These last two scenarios would mean that Apple would use ranking variables relating to its own identity or profitability, which fall under the forbidden ranking rationale of *self-favouring without objective justification*. The use of such variables would give an artificial competitive advantage to Apple in the rankings of search results, which is not based on the merits of the applications. It would unjustifiably steer consumers and distort the level playing field in favour of Apple's own applications over those of competitors. Therefore, it would constitute an infringement of the proposed non-discrimination principle.

Popularity ranking rationale

App developers operate in "winner-takes-most" markets, where 3% of the app developers get more than 80% of app downloads (Hyrynsalmi et al., 2016, p. 125). Apple uses the popularity ranking rationale, such as a variable for the number of downloads. The use of such variables may favour large and established over small and new businesses in downstream markets (section 1).

The use of a popularity ranking rationale leads to a self-enforcing mechanism or "entrenchment effect" (Pandey et al., 2005, p. 1). Large and established online businesses generally receive relatively many clicks and downloads, giving them a higher position in the rankings of search results. These higher rankings lead to more clicks and downloads for these firms, improving their rankings further. This self-enforcing mechanism could reduce the ability of new and small online businesses to challenge large and established players—even if they have a superior offer (Pandey et al., 2005, p. 1).

Based on parallels with the OI Regulation, the proposed non-discrimination principle aims to protect the ability of small and new players to challenge large incumbents within app stores (section 3). Drawing parallels with the assessment of zero-rating under the OI Regulation, the EU legislator could introduce an effects-based prohibition of popularity ranking variables. Based on multiple factors, the effects of using popularity ranking variables on consumer choice and the level playing field could be assessed. These factors could include the number of small players being ranked in top positions within a certain category of applications (e.g. music streaming) and the availability of alternative channels to small and new businesses to reach consumers. To provide legal certainty, the EU legislator could formulate factors that give rise to the legal presumption that the non-discrimination principle is not violated. Such factors could include that app store operators provide a

functionality to consumers to switch popularity variables on and off.

Circumvention of the forbidden ranking rationales

App store operators may attempt to circumvent the forbidden ranking rationales. One way could be that the app store operator tweaks the weights attached to the ranking variables in such a way that this results in a higher ranking of its own apps. Another way to circumvent the proposed non-discrimination principle could be that the app store operator uses a permitted ranking rationale, which nevertheless leads to a systematic advantage for its own apps when it is combined with other terms and conditions applicable to the app store. For example, Apple imposes an obligation on app developers that offer digital goods and services in the App Store to use its payment systems. This obligation is combined with a 30% commission in the first year (ACM, 2019, p. 96). This commission drives up the prices of these applications for consumers, while this is not the case for Apple's own applications. As a result, the use of the permitted ranking rationale of price could still favour Apple's own apps over those of competitors in the rankings of search results.

The OI Regulation prohibits any agreements and practices of ISPs that circumvent the goals and provisions of the Regulation (see for example BEREC, 2020, para 126). Similarly, the proposed framework would forbid app store operators to engage in ranking practices that circumvent the forbidden ranking rationales. The proposal for the DMA also seeks to ensure that the proposed prohibition of self-favouring rankings is not circumvented (Proposal DMA, Article 11). To that end, the current text of the DMA prohibits “any measure that may have an equivalent effect to the differentiated or preferential treatment in ranking” (Proposal DMA, consideration 49).

Section 5: Rebutting counter-arguments

Rankings have a limited impact on consumer choice

An argument against the proposed framework can be that discriminatory ranking practices of online platforms have little impact on consumer choice and the economic performance of online businesses. The argument goes that consumers with strong preferences will find the application they are looking for, even when their preferred application has a low ranking in the search results (Manne & Wright, 2012, p. 176). Consumers with weak preferences are to a larger degree influenced by the rankings, but their lack of preferences suggests little welfare loss (Manne & Wright, 2012, p. 177).

However, a study from Narayanan and Kalyanam (2015) suggests that consumers with weak preferences and lesser-known businesses are more strongly affected by online rankings. Consumers generally have less strong preferences for applications that are relatively unknown, while incumbents have had the time to form consumer preferences. New businesses generally belong to the category of lesser-known companies, which are thus more strongly affected by the position in the rankings.

Consumers with weak preferences arguably require additional protection, because they are more vulnerable to the influence that app store operators exert through their rankings of search results. The proposed non-discrimination principle aims to ensure that discriminatory rankings do not limit the ability of new app developers with superior offerings to challenge incumbents.

Regulation hampers innovation of search algorithms

Another concern with the proposed non-discrimination principle might be that regulation intervening with the ranking variables of platforms could reduce innovation of search algorithms (Crane, 2014, p. 401, p. 405). This decreases the ability of platforms to differentiate from each other, resulting in a loss of competition between platforms.

The proposed framework seeks to protect the innovation and competition in downstream markets, such as the market for music streaming services. More specifically, the framework aims to protect the ability of small and new app developers to compete with large and established players. This admittedly imposes limitations on the *direction* of upstream innovation and competition by app store operators. For example, introducing new self-favouring ranking variables without objective justification is not allowed (section 4). These limitations are, however, necessary for the protection of downstream innovation and competition.

Some scholars, such as Renda (2015) have argued that the rules in the OI Regulation could impede the development of innovative network technologies such as 5G. However, BEREC (2018) considers that the OI Regulation "leaves considerable room for the implementation of 5G technologies". The reason is that the non-discrimination principle in the OI Regulation leaves room for technically differential treatment of traffic based on objective technical requirements of traffic (section 3).

A similar argument can be made against the claim that regulation would stifle innovation of search algorithms. The proposed non-discrimination principle leaves room to develop innovative ranking variables for which there is potential con-

sumer demand, while protecting consumer choice and the level playing field. For example, app store operators could explore the implementation of new ranking variables representing quality, including privacy protection.

Competition between platforms gives incentive to serve consumers

Some scholars argue that competition between platforms forces them to provide high quality search results (Goldman, 2011, p. 101). The value of a platform depends on the presence of a diversity of applications for which there is consumer demand (Farrell & Weiser, 2003, p. 101). Platforms would therefore in principle have no incentive to discriminate against competing applications.

In principle, platforms have an interest in attracting a diversity of applications to increase the value of the platform. This might be different when an application becomes a *sufficient competitive threat* to the platform's business. In that case, the incentive for the platform to discriminate and avoid competition may dominate (Krämer & Schnurr, 2018, p. 524).

Two factors may lead to consumers showing limited switching behaviour in response to a decrease in quality of search results. Firstly, online platforms, such as Apple, often operate in highly concentrated markets characterised by high switching costs and network effects (Stucke & Ezrachi, 2017, pp. 76-77). Secondly, Patterson (2013) argues that search results can often be regarded as a so-called "credence good". This means that it is often hard for consumers to observe the quality of search results even after the search (Patterson, 2013, pp. 11-12). The combination of these factors may reduce the incentive for apps stores to produce high quality search results.

Discriminatory rankings are difficult to detect for authorities

The search algorithms of app stores are largely a "black box" (Pasquale, 2010, p. 170), which are protected by the trade secrets of app store operators. Although the P2B Regulation introduces various transparency requirements for app stores (section 2), these requirements will most likely leave some deviations from the proposed framework unrevealed. For example, the inclusion of "proxies for profit" in the algorithms (Mattioli, 2019, p. 6) and more subtle ways of circumventing the forbidden ranking rationales (section 4) would be difficult to detect for public authorities.

Therefore, the enforcement of the proposed framework would only be effective

when it is supplemented by a different transparency regime than currently applies under the P2B Regulation. Pasquale (2010) has for example proposed a regime of "qualified transparency", which would allow a government agency to detect discriminatory rankings while protecting the trade secrets of platforms. The regime could give a government agency the competence to audit the algorithms of an app store that acts as a gatekeeper when a reasonable suspicion of discriminatory rankings arises. The observed sudden drop of Spotify (section 1) could for example give rise to such a reasonable suspicion. The current text of the proposed DMA gives the European Commission the power to get access and explanations about algorithms when this is necessary for the implementation and enforcement of the provisions of the DMA, including the prohibition of self-favouring rankings (Proposal DMA, Article 19 and Article 21 in conjunction with consideration 69).

To increase legal certainty, the auditability regime could include a safe harbour for app store operators that follow a "due diligence procedure" to test for possible sources of discrimination in their algorithms (Zingales, 2019, pp. 414-415). The auditability regime could for example be executed by an independent body, consisting of technical experts, which would assist the authority that enforces the proposed non-discrimination principle (Pasquale, 2010, pp. 168-169). The proposal for the DMA provides the European Commission with the power to appoint "independent external experts and auditors to assist the Commission to monitor the obligations and measures and to provide specific expertise or knowledge to the Commission" (Proposal DMA, Article 24(2)). Future will show whether this will result in the creation of an independent body of technical experts that provide assistance to the Commission when using its proposed power to access algorithms for the implementation of the DMA.

Conclusion

Based on parallels with the Open Internet Access Regulation, this article proposes new *ex ante* regulation for rankings of search results in app stores. The proposed framework contains a prohibition for app store operators to differentiate between app developers in the rankings without objective justification. The article formulates permitted ranking rationales, such as those based on text relevance, price, quality and the legality of content. The use of these ranking rationales merely reflects consumer choice and the parameters of effective competition within a market economy. The article also formulates a categorical ban of self-favouring ranking rationales without objective justification and an effects-based prohibition of popularity ranking rationales. These prohibitions are essential to protect consumer choice and the ability of small and new app developers to compete against big

players in app stores. The article provides recommendations for the way that the EU legislator can shape a prohibition of discriminatory rankings in the DMA, and how this prohibition can be applied to app stores by the public authority that will implement and enforce the provisions of the DMA.

This article proposes a regulatory framework that focusses on discrimination in the rankings of app stores. Future research could explore if the proposed non-discrimination principle can also be applied to the ranking practices of other platforms, such as Google Search and Amazon. Furthermore, it could be investigated further what ranking rationales and variables caused the reported drop of Spotify in the rankings. The article raises questions about whether the EU legislator should also introduce an auditability regime for search algorithms in app stores. Future research could address how such an auditability regime would be shaped. There are ongoing discussions among policymakers and scholars about how EU competition law should be adapted to the needs of the digital economy. In its current shape, EU competition law does not deal effectively with discriminatory rankings in app stores. In line with the proposal for the DMA, the proposed regulatory framework in this article aims to complement EU competition law to ensure a more effective protection of consumer choice and the digital level playing field within app stores in the future.

ACKNOWLEDGEMENTS

The author wishes to express his gratitude to University researcher Juha Vesala and Professor Taina Pihlajarinne from the Faculty of Law, University of Helsinki. This article has benefited from their comments and input. The author would also like to thank the editors and reviewers of *Internet Policy Review* for their comments, which helped to improve the article further. Discussions with doctoral students at the University of Helsinki, including Olli Honkkila and Tone Knapstad, have also benefited the article. Any mistakes are the author's sole responsibility. Finally, the author wants to give special thanks to Helmi Liikanen.

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